Ham-Ant Digest   Sun, 19 Dec 93   Volume 93 : Issue 147

Today's Topics:
                        Antenna Tuner Question
                       Antenna Tuner Questions
             Designing a Yagi. An Algorithm ? (2 msgs)
                             License
                    Umbrella for 2m HT Antenna

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.

Date: Wed, 15 Dec 1993 20:39:34 GMT
From: nntp.ucsb.edu!library.ucla.edu!europa.eng.gtefsd.com!howland.reston.ans.net!
cs.utexas.edu!utnut!torn!nott!cunews!freenet.carleton.ca!FreeNet.Carleton.CA!
ae517@network.ucsd.edu
Subject: Antenna Tuner Question
To: ham-ant@ucsd.edu

In a previous article, rdewan@casbah.acns.nwu.edu (Rajiv Dewan) says:

>The former. ARRL book "Transmission Line Transformers" by Jerry
>Sevick, W2FMI is the authoritative reference.
>
>Rajiv
>aa9ch

Did you see Sevick's article in the Nov 93 issue of CQ. I ordered one of
his super baluns from amidon to replace the balun in my TenTec tuner. My
TenTec manual recommends a balanced load of no greater that 500 ohms with

the current balun!!

de ve3uav/aa8lu

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Date: 15 Dec 1993 19:56:19 GMT
From: nntp.ucsb.edu!library.ucla.edu!europa.eng.gtefsd.com!howland.reston.ans.net!
math.ohio-state.edu!news.acns.nwu.edu!casbah.acns.nwu.edu!rdewan@network.ucsd.edu
Subject: Antenna Tuner Questions
To: ham-ant@ucsd.edu

In an article Cecil Moore <kg7bk@indirect.com> wrote:
>
>I am teaching a ham class and have been asked questions that I can't
>answer (not unusual) but I can't find the answer in the Handbook or
>Antenna Book... Here they are:
>
>1. The Handbook says that an antenna tuner's loss is normally less than
>0.5 dB. Assuming a 10/1 SWR, is the loss greater when one is matching
>a load of 5 + j0, 500 + j0, 10 + j50,...etc.?
>

The loss in an antenna tuner, or any other tuned circuit for
that matter, is
        Quality Factor * Energy stored.

So what affects these two terms?

In general, larger mismatches will require larger energy storage.
This is a loose handwaving argument that can be made concrete
with the circuit and a Smith chart in hand. For instance,
when using a L matcher, both 100+0j and 200+0j can be matched with
an inductor in series and capacitor in parallel to the load. For
a given frequency the 200+j0 will require larger reactances.
The currents and energy stored will be higher and so for the same Q
the losses will be higher.

The quality factor depends on the quality of components and the
the construction. Silver plated large coils with taps instead of
roller contacts, silver plated capacitors of split stator design,
large silver plated straps within the tuner to deal with large
currents and careful placement of components in a huge case (keeping
strong field away from case helps in reducing losses) will result in
a high Q tuner. The only commercial one that filts all of these
criteria is the AEA AT3000 (not produced any more - alas).

I know that roller inductors with turn counter dials evoke the
feeling of quality and dollars - I will take the tapped coil
with Vectronics of AEA style switching any time.

>2. Which is the best antenna tuner, a T, Pi, Z,...etc.?

At the bare minimum, you need two elements - a capacitor and
an inductor to match. You may have to reverse it to match
different kinds of loads. As simple circuits with few components
are desirable from a low loss standpoint, the reversible-L is
favored. It also has the benefit of having a single unique
match point. Down side - the Q varies depending on the load
and can get quite bad.

The T or a Pi is an improvement as the match and the Q can be controlled.
The complicating factor is that there may be many dips and you
have to pick the deepest of the dips to get the best match. Tuning
is more complex. The down side is that more components are needed.
So they may have higher losses and tuning is more complex.

Further, some circuits are better at harmonic supression than
others and this could be a factor.

ARRL book on Antenna Matching is a valuable reference.

>
>3. What is the transfer function of a transmission-line transformer type
>Balun? i.e. Does a 4:1 Balun transform 1000 +j1000 to approximately
>250 + j250 or is it like the coax series-section transformer equations?
>

The former. ARRL book "Transmission Line Transformers" by Jerry
Sevick, W2FMI is the authoritative reference.

Rajiv
aa9ch
r-dewan@nwu.edu

Date: Thu, 16 Dec 1993 18:07:06 GMT
From: ucsnews!sol.ctr.columbia.edu!howland.reston.ans.net!europa.eng.gtefsd.com!
darwin.sura.net!fconvx.ncifcrf.gov!fcs260c!mack@network.ucsd.edu
Subject: Designing a Yagi. An Algorithm ?
To: ham-ant@ucsd.edu

In article <2emvqc$jj1@cismsun.univ-lyon1.fr> elendir@enst.fr () writes:

> Hi there,
>
> I know some now PD programs help you designing Yagi antennae (e.g. the
>excellent Yagimax). Since I have no PC at home, I was wondering if anybody
>were aware of the algorithm used by those utilities, in order to write a
>version for my own computer.
>
> Were can I find such info ?
>
> Thanx.
>
> 73 from France, Vince (waiting for my callsign, must be F1J.. or F1K..)
>
All programs (I think) are based on NEC (available on the internet in
c and fortran forms, look on your archie server , I think it's on ucsd.edu/
pub/hamradio). The curent non-military version is NEC2. There are notes in
these files on where to get the documentation.
 However NEC is hard to use, so various others have been developed
to fill in the gap. The best by far in my opinion is yagiopt (by Beezley,
look up QST for ads), because the code sits in an optimising loop and you
tell the program what your design criteria are and ask it to do the best job
it can. Many thousand of iterations are required to optimiase a 15 element
yagi for instance. The other programs (as far as I know, like yagimax)
don't optimise, you only do one iteration and then change the element lengths
etc yourself.
 Unlike NEC, you don't get the source code for these othere programs.
Also you need a PC. Yagiopt is also copy protected, something which I'm not
real happy about, but Beezely earns a living from this stuff so he can't give it
away even if it makes life a little more onconvenient for people like me.
 I'm assuming the yagopt code is correct and gives sensible results (
something I will find out with the yagi I'm making now), and if it is, then
it's the only game in town. So buy a PC and get a copy of yagiopt (it's about
$100). You tell yagiopt the weightings for gain/F to B/SWR and let it go.
Unfortunately you can't simultaneously weight the feed impedance, which always
winds up at 10ohms.
 Joe NA3T
 mack@ncifcrf.gov

Date: 17 Dec 93 09:35:34
From: mel.dit.csiro.au!its.csiro.au!dmssyd.syd.dms.CSIRO.AU!
dmsperth.per.dms.CSIRO.AU!uniwa!harbinger.cc.monash.edu.au!msuinfo!agate!
howland.reston.ans.net!sol.ctr.columbia.@@munnari.oz.au
Subject: Designing a Yagi. An Algorithm ?
To: ham-ant@ucsd.edu

Get a copy of W2PV's book on Yagi antennas from ARRL he has the theory

for these calculations in that book.
Merry Chrismas & 73's Bill

Date: 17 Dec 1993 15:01:32 CST
From: ftpbox!mothost!schbbs!maccvm.corp.mot.com!CSLE87@uunet.uu.net
Subject: License
To: ham-ant@ucsd.edu

Suggest you first contact Student Services and have them direct you to
the next meeting of the U of A Amateur Radio Club. They hold (held?) a
coordination for 2M repeater on 145.19 out and have been semi-active.
There are also several other good clubs in the Akron area. WA8NVW
----------------------- Original Article ------------------------
Newsgroups: rec.radio.amateur.antenna
From: R3RLB@VM1.CC.UAKRON.EDU
Subject: License
Sender: news@news.uakron.edu
Organization: The University of Akron
Date: Fri, 17 Dec 1993 12:37:42 GMT
Lines: 5

I am interested in getting a radio license and don't what to do or where to
go. If somebody would help me out I would appreciate the help

Thanks
Ron Black

Date: Thu, 16 Dec 1993 20:54:47 GMT
From: ucsnews!sol.ctr.columbia.edu!howland.reston.ans.net!usenet.ins.cwru.edu!
news.csuohio.edu!vmcms.csuohio.edu!R0264@network.ucsd.edu
Subject: Umbrella for 2m HT Antenna
To: ham-ant@ucsd.edu

Anybody ever try an umbrella for a 2m HT antenna? I guess a 1/4 wave
radiating element could be stuck up from the top and the spreaders trimmed
for radial elements. What else would be needed?   Phil, aa8jo.

End of Ham-Ant Digest V93 #147
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